



# Enterprise JavaBeans and WebObjects

**Session 708**





# Enterprise JavaBeans and WebObjects

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**WebObjects Engineering**

# What You Should Know

- Basic understanding of WebObjects
- Basic understanding of EJB and associated J2EE technologies



# What You Will Learn

- How EJB and EOF are complementary, not competing technologies
- How the EJB container benefits WebObjects applications
- Understand how to develop and deploy EJBs with WebObjects



# Topics Not Covered

- How to implement beans in general
- J2EE Design Patterns and SUN BluePrints



# Agenda

- EJB and EOF: complement or compete?
- The OpenEJB container
- WebObjects and EJB integration
- Demos
- Tips and Tricks
- Q&A



# Which Version of EJB Are We Talking About?

- WebObjects is bundled with an EJB 1.1 compatible container
- Current EJB component market based on EJB 1.1
- EJB Container is not Sun certified



# Selected EOF Strengths

- EO business logic is data source independent
- Hides database specifics: SQL generation, primary key generation
- Change your schema without changing your code
- Relationships handled automatically
- Rapid development tools
- Optimized for in-process use





# Selected EJB Strengths

- Strong transaction and security model
- Designed for multi-client, remote access
- Access to library of third-party Beans
- Access to additional data sources, e.g., JCA, JMS
- RMI/IIOP allows clients in any programming language
- “Standard” J2EE



# Why Add EJB to WebObjects?

- EOF and EJB each have different strengths
- Leverage emerging EJB component market
- Complements Servlet support
- Complete solution from Apple



# Which Container Did We Choose?

- Investigated various solutions
- Requirements
  - Self-contained
  - Useable from WO web layer
  - Extensible
  - RMI/IIOP support



# OpenEJB

- Stand-alone EJB 1.1 compatible container
- All services are pluggable
- Rapid development mode
- Efficient, small footprint
- RMI/IIOP support



# OpenEJB (Cont.)

- We have also integrated:
  - OpenORB—CORBA ORB
  - Tyrex—Transaction Manager
  - Castor—Persistence Manager

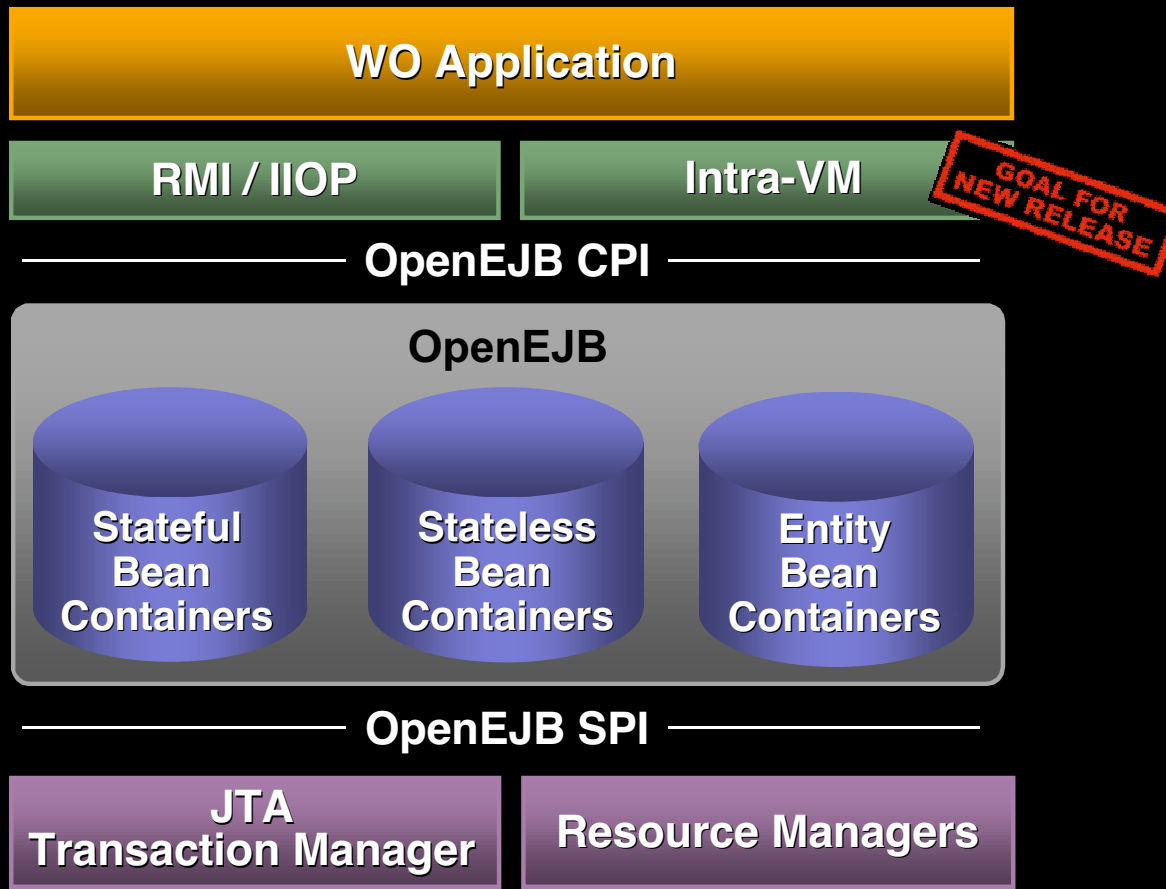


# OpenEJB Is Not

- A product competing with WebLogic, WebSphere and the like



# OpenEJB Architecture Overview



# WebObjects Use of OpenEJB

- Container started in process
  - Low latency
  - No security issues
  - Simple for deployment management





# Tools Integration

- EJB components represented as Frameworks
- Project Builder: assistant and build support
- Automatic EJB container start
- OpenEJBTool: XML based deployment tool
- EOBeanBuilder: Entity Bean generation tool

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# EJB Framework

- Basic Idea: EJB component is equivalent to a Framework
- New Project type in PB
- Contains no container specific deployment information
- Separate jars for interfaces and implementation
- Jars are exportable to any EJB Container



# Project Builder Support

- Import existing compiled Beans
- Develop Beans from source



# Importing Existing Beans

- Build support takes one or more EJB components
- Merges jars and deployment descriptors
- Will generate RMI/IIOP stubs if necessary
- Will run an optional bean verification tool
- Framework ready to use

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# Developing Beans From Source

- Assistants help create template classes for all four bean types
- PB maintains deployment descriptor
- Will generate RMI/IIOP stubs if necessary
- Will run an optional bean verification tool

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# EJB in WO Applications

- Option “Deploy as EJB Container”
  - Adds required EJB frameworks
  - Creates container configuration files
  - Adds them to project
- Tip: Make sure your Bean frameworks are compiled first



# Automatic Container Start

- Implemented as a framework
- Starts the EJB container in-process
- Used for both IntraVM and RMI/IIOP transport layer
- Various options to control EJB container and logging

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# OpenEJBTool

- Creates deployment info for EJB container
- Templates for database configuration and CMP configuration





# Container Configuration

- Controlled by XML configuration files:
  - TransactionManagerConfiguration.xml
  - OpenEJBConfiguration.xml
  - Only needed for CMP deployment:
    - CMPConfiguration.xml
    - GlobalTransactionConfiguration.xml
    - LocalTransactionConfiguration.xml



# Current Limitations

- EOF and EJB have different transaction scopes
- EOF not supported in EJB beans
- No change notifications between EJB/EOF layers





# Demo

**Creating an EJB Using Project Builder**

**Stefan Reich**  
**WebObjects Engineering**

# EObjectBuilder

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- Generates deployment-ready Entity Beans from an EOModel file
- Wide range of options to control code generation
- Limitation: No relationships are modeled
- New in the forthcoming release





# Demo

Using EOBeanBuilder

**Stefan Reich**  
**WebObjects Engineering**

# Development Tips

- Design the database with EOModeler
- Use EOBeanBuilder to generate first version, and change if necessary
- Implement business logic in session beans
- Use a deployment verification tool:
  - Change the property “EJB\_JAR\_VERIFIER” to the appropriate value (e.g., “J2EESDK1.3”)

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# Debugging Tips

- Enable verbose mode of OpenEJB
  - -DWOEJBContainerDebug=true
- Enable ORB logging
  - -DWOEJBORBDebugLogLevel=0.5
- Use Project Builder debug support
- Forthcoming: log4j logging

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# Demo

**PetStore Demo**

**Stefan Reich**  
**WebObjects Engineering**



# Executive Summary

- EJB integration is ready for development and deployment
- Strong Tool support to reduce development time
- EJB supplements WebObjects



# WebObjects Beta

- To be considered for the beta  
[Appleseed.apple.com/webobjects](http://Appleseed.apple.com/webobjects)



# WebObjects Lab

- Located downstairs in Room L
- Lab hours
  - Monday 12:00pm–6:00pm
  - Tuesday 9:00am–2:00pm
  - Wednesday 9:00am–6:00pm
  - Thursday 9:00am–6:00pm
  - Friday 9:00am–6:00pm



# Roadmap

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**FF013 WebObjects**

Room A1  
Fri., 3:30pm



# Who to Contact

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## **Apple Professional Services (Training, Support, Consulting)**

(800) 848-6398  
[services@apple.com](mailto:services@apple.com)

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# For More Information

- WebObjects Developer Documentation  
<http://developer.apple.com/techpubs/webobjects>
- Apple Professional Services Technical Support  
[www.apple.com/services/technicalsupport](http://www.apple.com/services/technicalsupport))
- Other places
  - [www.apple.com/webobjects](http://www.apple.com/webobjects)
  - [developer.apple.com/webobjects](http://developer.apple.com/webobjects)
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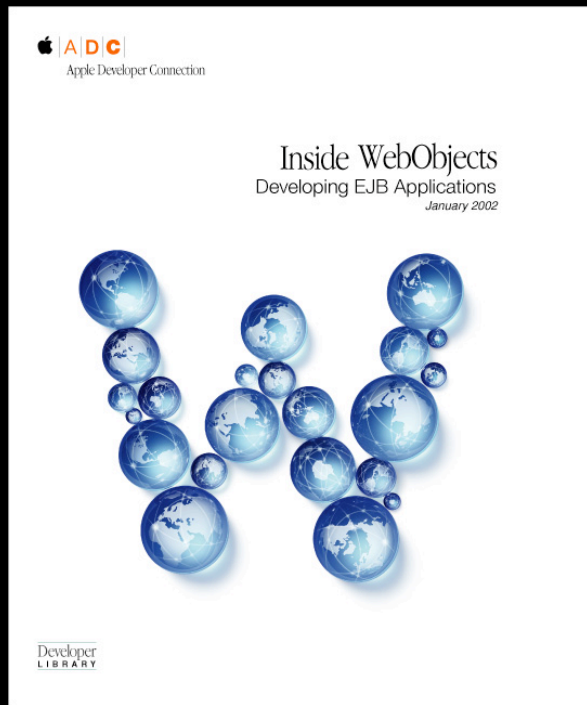


# For More Information

- OpenEJB project  
<http://openejb.sf.net>
- Castor and Tyrex  
<http://exolab.org>
- Many EJB books



# Documentation



- Developing EJB Applications
- Developing Applications Using JavaServer Pages and Servlets

**Documentation > WebObjects > Development**



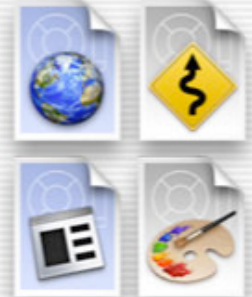
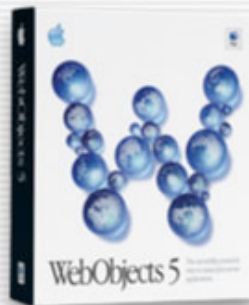
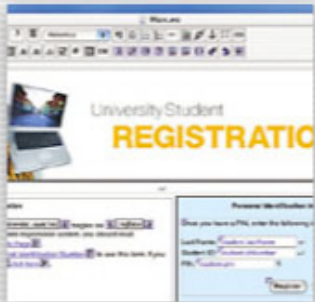
# How to Access Documentation

- Most up-to-date: PDF and HTML  
<http://developer.apple.com/techpubs/webobjects>
- Hardcopy print-on-demand  
[Vervante.com](http://Vervante.com) under Related Resources
- Product CD  
Documents folder and installed in  
[/Developer/Documentation/WebObjects](#)
- In the box (localized)  
Installation Guides, What's New, WebObjects Overview, Java Client Desktop Applications, Discovering WebObjects for HTML
- Check ADC News for latest updates  
<http://developer.apple.com/devnews>





# Q&A



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**<http://developer.apple.com/wwdc2002/urls.html>**

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